

Factor

HPC 10

$$\begin{aligned} 1) & 3x^4 + 6x^2 - 24 \\ &= 3(x^4 + 2x^2 - 8) \\ &= 3(x^2 + 4)(x^2 - 2) \end{aligned}$$

$$\begin{aligned} 2) & -2x^4 + 8x^3y - 8x^2y^2 \\ &= -2x^2(x^2 - 4xy + 4y^2) \\ &= -2x^2(x - 2y)(x - 2y) \end{aligned}$$

$$\begin{aligned} 3) & 3x^3 + 6x^2 - 4x - 8 \\ &= 3x^2(x + 2) - 4(x + 2) \\ &= (x + 2)(3x^2 - 4) \end{aligned}$$

$$\begin{aligned} 4) & x^2 - 4y^2 \\ &= (x + 2y)(x - 2y) \end{aligned}$$

$$\begin{aligned} 5) & 3x^3 - 3x^2 - 6x \\ &= 3x(x^2 - x - 2) \\ &= 3x(x - 2)(x + 1) \end{aligned}$$

$$\begin{aligned} 6) & 6x^2 + 17x + 12 \\ & 6x^2 + 9x + 8x + 12 \\ & 3x(2x + 3) + 4(2x + 3) \\ & (2x + 3)(3x + 4) \end{aligned}$$

$$\begin{aligned} 7) & 9x^4 - 49y^2 \\ &= (3x^2 + 7y)(3x^2 - 7y) \end{aligned}$$

$$\begin{aligned} 8) & -25x^2 + 20xy - 4y^2 \\ &= -(25x^2 - 20xy + 4y^2) \\ &= -(5x - 2y)(5x - 2y) \end{aligned}$$

$$\begin{aligned} 9) & -3x^2 + 5x - 2 \\ &= -(3x^2 - 5x + 2) \\ &= -[3x^2 - 3x - 2x + 2] \\ &= -[3x(x - 1) - 2(x - 1)] \\ &= -(x - 1)(3x - 2) \end{aligned}$$

$$\begin{aligned} 10) & x^4 - 16 \\ &= (x^2 + 4)(x^2 - 4) \\ &= (x^2 + 4)(x + 2)(x - 2) \end{aligned}$$

$$11) 4x^2 + 22x + 12$$

$$= 2(2x^2 + 11x + 6)$$

$$12) 6x^3 - 6x$$

$$= 6x(x^2 - 1)$$

$$= 6x(x+1)(x-1)$$

$$13) 2x + yz + 2z + xy$$

$$= 2x + 2z + yz + xy$$

$$= 2(x+z) + y(z+x)$$

$$= (x+z)(2+y)$$

$$14) -9x^2y^2 + 6xy - 1$$

$$= -(9x^2y^2 - 6xy + 1)$$

$$= -(3xy-1)(3xy-1)$$

$$15) 49x^2 + 106x + 64$$

$$= (7x+8)(7x+8)$$

check $\rightarrow 49x^2 + 56x + 56x + 64$

$$= 49x^2 + 112x + 64$$

Does not factor!

$$16) -25x^2 - 49y^2$$

$$= -(25x^2 + 49y^2)$$

Done

$$17) -4x^4 - 4x^3y - x^2y^2$$

$$= -x^2(4x^2 + 4xy + y^2)$$

$$= -x^2(2x+y)(2x+y)$$

$$18) 3x^4 - 12y^4$$

$$= 3(x^4 - 4y^4)$$

$$= 3(x^2 + 2y^2)(x^2 - 2y^2)$$